Test 4
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Math 097

Name: KEY 2:22 2:31

We run carelessly to the precipice, after we have put something before us to prevent us from seeing it.

Blaise Pascal (1623 - 1662)
French mathematician

No work = no credit

Warm-ups (1 pt each): $0^0 =$ UND $-3^2 = -9$ $\frac{3}{0} =$ UND

1.) (2 pts) Solve: $\frac{3x}{4} - \frac{1}{3} = 1 - \frac{2}{3}\left(x - \frac{1}{6}\right)$

$\frac{3x}{4} - \frac{1}{3} = 1 - \frac{2}{3}x + \frac{2}{18}$

$27x - 12 = 30 - 24x + 4$

$51x = 52$

$x = 52/51$

2.) (4 pts) Solve for all solutions of $x^4 - 21x^2 - 35 = 65$

$u = x^2$

$u^2 - 21u - 100 = 0$

$(u - 25)(u + 4) = 0$

$u = 25$ OR $u = -4$

$x^2 = 25$ OR $x^2 = -4$

$x = \pm 5$ or $x = \pm 2i$

3.) (4 pts) Solve $3\sqrt{4x-8} - 5 = 7$

$\Rightarrow 3\sqrt{4x-8} = 12$

$\Rightarrow \sqrt{4x-8} = 4$

$\Rightarrow 4x - 8 = 16$

$\Rightarrow 4x = 24$

$\Rightarrow x = 6$ ✓

$x = 6$

4.) (4 pts) Solve for all solutions of $\left(r+\frac{4}{r}\right)^2 = 5\left(r+\frac{4}{r}\right)$

$\Rightarrow u = r + \frac{4}{r}$

$\Rightarrow u^2 - 5u = 0$

$\Rightarrow u(u-5) = 0$

$\Rightarrow u = 0$ or $u = 5$

$\Rightarrow r + \frac{4}{r} = 0$ OR $r + \frac{4}{r} = 5$

$\Rightarrow r^2 + 4 = 0$ OR $r^2 - 5r + 4 = 0$

$r = \pm 2i$

OR

$(r-4)(r-1) = 0$

$r = 4$ or $r = 1$

$r = \pm 2i$ OR $r = 4$ OR $r = 1$

5.) (4 pts) Solve $\sqrt{2w^2+11w+14} - 2 = w$

$\Rightarrow \sqrt{2w^2+11w+14} = w+2$

$\Rightarrow 2w^2+11w+14 = w^2+4w+4$

$\Rightarrow w^2+7w+10 = 0$

$\Rightarrow (w+5)(w+2) = 0$

$\Rightarrow w = -5$ OR $w = -2$

Check

$w = -2$

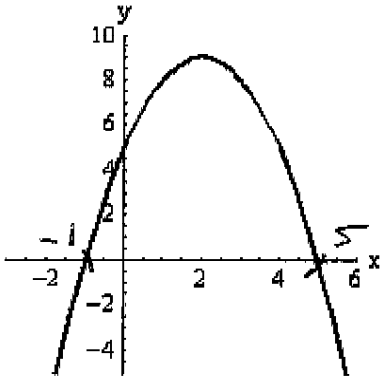
6.) (3 pts) For the function $f(x)=\frac{2x-1}{x+3}$, find:

i.) $f(0)=$ $-1/3$

ii.) $f(3)=$ $5/6$

iii.) $f(-3)=$ und.

7.) (4 pts) Use the graph to solve $-x^2+4x+5\geq 0$



$-1\leq x\leq 5$

8.) (4 pts) Use the test point method to solve $x^2+2x-24>0$

$(x+6)(x-4)>0$

$+ \quad 0 \quad - \quad 0 \quad +$

$-6 \qquad 4$

$x<-6$ or $x>4$

9.) (4 pts) Solve $7k+k^2-6=9k$ using any method

$k^2-2k-6=0$

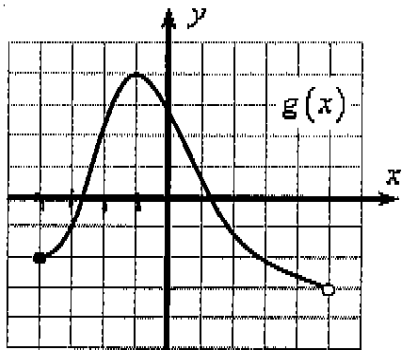
$k=\frac{2\pm\sqrt{4-4(1)(-6)}}{2(1)}$

$=\frac{2\pm\sqrt{28}}{2}$

$=\frac{2\pm 2\sqrt{7}}{2}$

$k=1\pm\sqrt{7}$

10.) (4 pts) Use the given graph of $g(x)$ to answer the following questions. Give answers in interval notation.



Note: The gridlines are 1 unit apart.

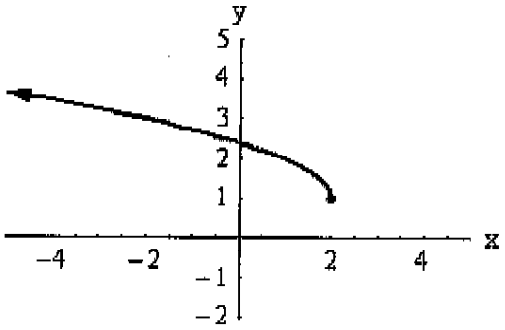
a.) (2 pts) What is the domain of g?

$[-4, 5)$

b.) (2 pts) What is the range of g?

$(-3, 4]$

11.) (4 pts) Use the function and its graph to find the domain and range of $h(x) = \sqrt{2-x} + 1$. Express your answer in interval notation.



i.) Domain: $(-\infty, 2]$

ii.) Range: $[1, \infty)$

12.) (4 pts) Solve $\sqrt{x+3} - \sqrt{x+19} = -2$

$\Rightarrow \sqrt{x+3} = \sqrt{x+19} - 2$

$\Rightarrow x + 3 = x + 19 - 4\sqrt{x+19} + 4$

$\Rightarrow -20 = -4\sqrt{x+19}$

$\Rightarrow 5 = \sqrt{x+19}$

$\Rightarrow 25 = x + 19$

$\Rightarrow x = 6$

$x = 6$